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NO. 956

P. 2  
P. 2**PATENT**

Attorney Docket No. A-64260-2/DJB/RMS

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of )

Nolan )

Serial No. 08/963,368 )

Filed: November 3 1995 )

For: *Methods for Screening For*  
*Transdominant Intracellular*  
*Effector Peptides and RNA*  
*Molecules* )

Art Unit: 1644

Examiner: F. VanderVegt, Ph.D.

I hereby certify that this correspondence is being  
deposited with the United States Postal Service as  
first class mail in an envelope addressed to:  
Assistant Commissioner for Patents, Washington,  
D.C. 20231, on December 8, 1998

Signed: 

Maria Ciganovich

**DECLARATION UNDER 37 C.F.R. §1.132**

Sir:

I, Garry P. Nolan, declare as follows:

1. I am a citizen of the United States of America and reside at Palo Alto, California. A copy of my most recent curriculum vitae is attached.

2. I am the inventor on the above-identified application. I have reviewed and am familiar with the Kitamura, *et al.* reference in Proceedings of the National Academy of Science (USA), Vol. 92, pp. 9146-9150, dated September 1995. This reference was authored by Toshio Kitamura, Mayumi Onishi, Shigemi Kinoshita, Akira Shibuya, Atsushi Miyajima, and myself.

3. Prior to the collaboration that resulted in this paper, I had previously been working in the area of retroviral vectors while at David Baltimore's laboratory at the Rockefeller University. Shigemi Kinoshita was a post-doctoral fellow working in my laboratory at Stanford University. Toshio Kitamura, Mayumi Onishi, Akira Shibuya, and

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Atsushi Miyajima were scientists at DNAX Research Institute and were recognized as leaders in the production of cDNA libraries; however, they had no prior experience with retrovirus vectors. I conceived of the idea of making a retroviral cDNA library and contacted the DNAX researchers. Thus, I initiated a research collaboration with them and Shigemi Kinoshita to produce retroviral cDNA expression libraries.

4. The contribution of Toshio Kitamura, Mayumi Onishi, Shigemi Kinoshita, Akira Shibuya, and Atsushi Miyajima to the work described in the Kitamura *et al.* reference was limited solely to executing my idea of producing a cDNA expression library with retroviral vectors. Essentially, therefore, Toshio Kitamura, Mayumi Onishi, Shigemi Kinoshita, Akira Shibuya, and Atsushi Miyajima were under my direction and supervision in the synthesis of these libraries, and did not contribute to the conception of the invention. Accordingly, Toshio Kitamura, Mayumi Onishi, Shigemi Kinoshita, Akira Shibuya, and Atsushi Miyajima were co-authors, but not inventors, of the work described in the Kitamura *et al.* article.

5. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 12/8/98

  
Garry P. Nolan

NO. 956 P. 4  
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**Curriculum Vitae**  
**Garry P. Nolan, Ph.D.**

### Personal Information

**Born:** January 8, 1961. Liverpool, England  
**Citizenship:** United States  
**Telephone:** (415) 725-7002

### Education

#### Undergraduate School

1979-1983 Cornell University, B.S., Biology, specialization in Genetics  
Research: Rhizobium/Legume Microbial Genetics  
Scientific Advisor: Professor Aladar Szalay

#### Graduate School

1983-1989 Ph.D. student, Department of Genetics, Stanford University  
Research: Immunogenetics, Individual Cell Gene Expression  
Scientific Advisor: Professor Leonard Herzenberg  
Thesis Dissertation: Individual cell gene regulation studies and *in situ* detection of transcriptionally-active chromatin using fluorescence-activated cell sorting with a viable cell fluorogenic assay

#### Postdoctoral Work

1989-1990 Postdoctoral Fellow  
Department of Genetics, Stanford University  
Research: Epigenetics of Mammalian Gene Expression; Whole Animal Cell Sorting  
Scientific Advisor: Professor Leonard Herzenberg  
1990-1993 Postdoctoral Fellow  
NIH Fellow  
(1990-1991) Whitehead Institute for Biomedical Research  
Leukemia Society Special Fellow  
(1991-1993) The Rockefeller University  
Research: Biology of Normal and Aberrant Gene Expression  
Controlled by the NF- $\kappa$ B/I $\kappa$ B Family of polypeptides  
Scientific Advisor: Professor David Baltimore

### Faculty Positions

1993-present Assistant Professor (March 1993-present)  
Department of Molecular Pharmacology, Stanford University School of Medicine  
Research: Rel and Ankyrin proteins in the regulation of pathologic disease states: HIV and Leukemia. Multi-parameter single cell measures of gene regulation by flow cytometric analysis. Dominant negative analysis of NF- $\kappa$ B signal transduction cascades. High-Titre retroviral production systems  
1995-present Assistant Professor (September 1995-present), Joint Appointment  
Department of Microbiology and Immunology, Stanford University School of Medicine

## Honors and Fellowships

Cornell University, Dean's List.

Admissions Committee: Ph.D. Program, Department of Genetics, Stanford University.

National Science Foundation Fellowship. Organization and Function of the Eukaryotic Genome. Spetsai, Greece. September 1988.

Awarded American Cancer Society Fellowship (declined).

National Institutes of Health Fellowship: June 1990-June 1992.

Leukemia Society Special Fellow: July 1992-June 1995.

Leukemia Society Scholar Award: July 1995-June 2000.

Hume Faculty Scholar: 1993-1998

Board of Trustees, Leukemia Society of America, Northern California: 1995-1998.

1996 Burroughs Wellcome Fund New Investigator Award: July 1996 - June 2000.

Stanford University: Howard Hughes Medical Institute Junior Faculty Scholar Award. May 1997 - April 1998

## National Societies

American Association for the Advancement of Science

Society of Developmental Biology

American Society for Microbiology

## Manuscript Reviews

*Nature*

*Human Gene Therapy*

*Molecular and Cellular Biology*

*Journal of Biological Chemistry*

*Science*

*Immunity*

## Editorial Boards

*Chemistry and Biology* (1997-1999)

*Gene Therapy & Molecular Biology*

*Cells to Genes*

*Journal of Virology*

*Journal of Immunology*

*Proceedings of the National Academy of Science*

*Cell*

*nature biotechnology*

*Biotechniques*

## Teaching Experience

Teaching Assistant: "Medical Genetics", Stanford University School of Medicine, 1983.

Instructor/Lecturer: EMBO Course "Flow Cytometry and Sorting in Molecular Biology", Cologne, Germany. September 1988.

Instructor/Lecturer: International Becton Dickinson Immunocytometry Series. Applications of Flow Cytometry to Molecular Biology. February 1989.

Instructor/Lecturer: Medical Pharmacology, Advanced Immunology, Stanford University School of Medicine, 1993-98.

Instructor/Course Director: Advanced Immunology, Stanford University School of Medicine, Spring 1994.

Lecturer: Antimicrobiology and Antiviral Therapy, Stanford University School of Medicine, 1994-1996.

Lecturer: Virology, Stanford University School of Medicine, 1996.

Instructor/Course Director: Molecular Biology of Gene Therapy, Stanford University School of Medicine, 1998

## Invited Speaker (selected list)

University of Koln, EMBO Flow Cytometry Course, Koln, 1988.

Institut Pasteur, Unite de Biologie Moleculaire du Developpement, Paris, 1988.

Karolinska Institutet, Department of Tumour Biology, Stockholm, 1988.

Becton Dickinson Immunocytometry Systems, San Francisco, 1989.

7th International Congress of Immunology, Workshop, Berlin, 1989.

Genentech, Division of Molecular Biology, South San Francisco, 1989.

Genentech, Flow Cytometry Meeting, South San Francisco, 1990.  
 RIKEN Frontier Research Program, Tsukuba, Japan, June 1991.  
 Tokyo University, Japan, Institute of Medicine, June 1991.  
 Osaka University, Japan, Department of Molecular Biology, June 1991.  
 Kyoto University, Japan, Symposium, April 1992.  
 Systemix, Palo Alto, May 1993.  
 DNAX, Palo Alto, June 1993.  
 Tularik, Inc., South San Francisco, February 1994.  
 Leukemia Society Mtg., Dublin, Ireland, September 1994.  
 Roche, Inc., Palo Alto, September 1995.  
 University of Michigan, November 1995.  
 Pfizer, Inc., Groton, CT, 1995.  
 Chiron, February, 1996.  
 Applied Immune Science, February 1996.  
 UC Irvine, February 1996.  
 Cornell Medical Center 1996.  
 Columbia Medical Center 1996.  
 MIT, November 1996  
 Harvard School of Public Health, November 1996.  
 UCSF Grand Rounds, November 1996.  
 The Burnham Institute. La Jolla, December, 1996.  
 Amgen Institute, Toronto, Ontario, Canada, Sept. 1997.  
 Harvard University, Dept. of Cell Biology, November 1997.  
 MIT, Dept. of Biology and Whitehead Institute, November 1997.  
 Amgen Institute, Thousand Oaks, CA, April 1998  
 Amgen Institute, Toronto, Ontario, CA, May 1998.  
 Genentech, S. San Francisco, CA, July 1998.  
 UCSF, Immunology Program, CA Sept 1998.  
 Univ. of Michigan, HHMI, Ann Arbor, MI. Nov. 1998  
 Merck & Co., Inc. West Point, PA. Nov. 1998

### **Invited Symposia Speaker**

Gordon Conference, Medicinal Chemistry, New Hampshire, August 1995.  
 Gallo Lab Meeting, NIH, Bethesda, MD, August 1995.  
 Symposia of the Society of Developmental Biology, San Diego, CA, August 1995.  
 Transcription Meeting, Ireland, October 1995.  
 Gene Therapy Course, Italy, October 1995.  
 Frontiers in Gene Therapy, Vanderbilt University, Nashville, TN, September 1995.  
 Keystone Symposia, Molecular and Cellular Biology of Gene Therapy, April 1997.  
 EMBO Meeting: Viral Vectors in Basic Biology, Heidelberg, April 1997.  
 NATO Advanced Study Institute on Gene Therapy. Spetsai, Greece, August 1997.  
 The Twelfth Rinshoken International Conference, Tokyo, Japan, October 1997.  
 Keystone Symposia, Molecular and Cellular Biology of Gene Therapy, January, 1998  
 IBC Genomics and Proteomics Conference, La Jolla, Session Chair, April 1998

NIH Policy Meeting on Lentiviral Vectors, Bethesda, MD. March 1998  
 Keystone Symposia, HIV Pathogenesis and Treatment, March 1998  
 The American Society of Gene Therapy (Inaugural Meeting), Seattle, May 1998.  
 Protein Genomics, CHI Conference, Session Chair, Boston, June 1998.  
 Int'l Centre for Genetic Engineering and Biotechnology, Lecture Course, Udine, Italy, July 1998.  
 Int'l Symposia on Protein Interaction Technologies, San Francisco, Oct. 1998  
 Int'l Symposia organized by CAPITAL Magazine, Dresden, Germany, Nov. 1998  
 Sixth Meeting of the European Working Group on Human Gene Transfer and Therapy, Israel, Nov. 1998  
 Keystone Symposia, Molecular and Cellular biology of Gene Therapy. January 1999

## Publications

- (1) G.P. Nolan. (1978). Carnivorous Plant Newsletter, Volume 7: 79-81. September.
- (2) Nolan, G. P., Maina, C., Szalay, A.A. (1984). Plasmid-Mapping Computer Program. Nucleic Acids Research. 12: 717.
- (3) Maina, C., Nolan, G. P. and Szalay, A.A. (1984). Molecular Weight Determination Program. Nucleic Acids Research. 12: 695.
- (4) Nakauchi, H., Nolan, G. P., Hsu, C., Huang, H.-S., Kavathas, P., and Herzenberg, L. A. (1985). Molecular Cloning of *Lyt-2*, a membrane glycoprotein marking a subset of mouse T lymphocytes: Molecular homology to its human counterpart, *Leu-2/T8*, and to immunoglobulin variable regions. Proceeding of the National Academy of Sciences USA. 82: 5126.
- (5) Tagawa, M., Nakauchi, H., Herzenberg, L.A., and Nolan, G. P. (1986). Formal Proof that Different-Size *Lyt-2* Polypeptides Arise from Differential Splicing and Post-Transcriptional Regulation. Proceeding of the National Academy of Sciences USA. 83: 3422.
- (6) Nakauchi, H., Tagawa, M., Nolan, G. P. and Herzenberg, L.A. (1987). Isolation and Characterization of the gene for the murine T cell differentiation antigen and immunoglobulin-related molecule, *Lyt-2*. Nucleic Acids Research. 15: 4337.
- (7) Nolan, G. P., Fiering, S., Nicholas, J.-F., Herzenberg, L.A. (1988). Fluorescence-activated cell analysis and sorting of viable mammalian cells based on  $\beta$ -D-galactosidase activity after transduction of *Escherichia coli LacZ*. Proceedings of the National Academy of Sciences USA. Vol 85, pp 2603-2607.
- (8) Yancopoulos, G.D., Nolan, G. P., Pollack, R., Prockop, S., Li, S., Herzenberg, L.A., and Alt, F.W. (1990). A novel fluorescence-based system for assaying and separating live cells according to VDJ recombinase activity. Mol Cell Bio 10, pp 1697-1704.
- (9) Ghosh, S., Gifford, A.M., Riviere, L.R., Tempst, P., Nolan, G. P. and Baltimore, D. (1990). Cloning of the p50 DNA-binding subunit of NF- $\kappa$ B: homology to *rel* and *dorsal*. Cell 62, 1019-1029.
- (10) Fiering, S., Northrop, J.P., Nolan, G. P., Mattila, P.S., Crabtree, G.R., and Herzenberg, L.A. (1990). Single cell assay of a transcription factor reveals a threshold in transcription activated by signals emanating from the T-cell antigen receptor. Genes and Development 4:1823-1834.
- (11) Krasnow, M.A., Cumberledge, S., Manning, G., Herzenberg, L.A. and Nolan, G. P. (1991). Whole animal cell sorting of *Drosophila* embryos. Science 251, 81-85.
- (12) Nolan, G. P., Ghosh, S., Liou H.-C., Tempst, P. and Baltimore, David. (1991). DNA-binding and I $\kappa$ B inhibition of the cloned p65 subunit of NF- $\kappa$ B, a *rel*-related polypeptide. Cell 64, 961-969.
- (13) Fiering, S.N., Roederer, M., Nolan, G. P., Micklem, D.R., Parks, D.R., & Herzenberg, L.A. (1991) Improved FACS-Gal: Flow cytometric analysis and sorting of viable eukaryotic cells expressing reporter gene constructs. Cytometry 12:291-301.
- (14) Nolan, G. P. and Baltimore, David. The Inhibitory *Ankyrin* and Activator *Rel* Proteins. (1992). Current Opinion in Genetics and Development. Eds T. Maniatis and H. Weintraub. Vol 2. pp211-220.
- (15) Fujita, T., Nolan, G. P., Ghosh, S., and Baltimore, D. (1992) Independent modes of transcriptional activation by the p50 and p65 subunits of NF- $\kappa$ B. Genes and Development 6, pp775-787.

- (16) Liou, H.-C., Nolan, G.P., Ghosh, S., Fujita, T., and Baltimore, D. (1992) The NF- $\kappa$ B p50 precursor, p105, contains an internal I $\kappa$ B-like activity that preferentially inhibits p50. *EMBO* 11, pp3003-3009.
- (17) Scott, M.L., Fujita, T., Liou, H.-C., Nolan, G.P., and Baltimore, D. (1993) The p65 subunit of NF- $\kappa$ B regulates I $\kappa$ B by two distinct mechanisms. *Genes and Development* 7a pp 1266-1276.
- (18) Fujita, T., Nolan, G.P., Liou, H.-C., Scott, M., and Baltimore, D. (1993) The candidate proto-oncogene *bcl-3* encodes a transcriptional adaptor that activates NF- $\kappa$ B p50 homodimer. *Genes and Development* 7b, pp1354-1363.
- (19) Nolan, G.P., Fujita, T., Bhatia, K., Huppi, C., Liou, H.-C., Scott, M.L., and Baltimore, D. (1993) The *bcl-3* proto-oncogene encodes a nuclear I $\kappa$ B-like molecule that preferentially interacts with NF- $\kappa$ B p50 and p52 in a phosphorylation-dependent manner. *Molecular Cell Biology* 6:3557-3566.
- (20) Pear, W., Nolan, G.P., Scott, M., Baltimore, D. (1993) Production of high titer helper-free retroviruses by transient transfection. *Proceedings of the National Academy of Sciences (USA)*, 90:8392-8396.
- (21) Nolan, G.P. (1994) NF-AT-AP-1 and Rel-bZIP: Hybrid vigor and binding under the influence. *Cell* 77:795-798.
- (22) Northrop, J.P., Ho, S.N., Chen, L., Thomas, D.J., Timmerman, L.A., Nolan, G.P., Admon, A., and Crabtree, G.R. (1994) NF-AT components define a family of transcription factors targeted in T-cell activation. *Nature* 369:497-502.
- (23) Grandison, L., Nolan, G.P., Pfaff, D.W. (1994) Activation of the transcription factor NF- $\kappa$ B in GH<sub>3</sub> pituitary cells. *Molecular and Cellular Endocrinology* 106:9-15.
- (24) Kitamura, T., Onishi, M., Kinoshita, S., Shibuya, A., Miyajima, A., and Nolan, G.P. (1995) Efficient screening of retroviral cDNA expression libraries. *PNAS* 92:9146-9150.
- (25) Pear, W., Scott, M., and Nolan, G.P. (1997) Generation of high titre, helper-free retroviruses by transient transfection. In *Methods in Molecular Medicine: Gene Therapy Protocols*, (P. Robbins, ed.), Humana Press, Totowa, NJ), pp. 41-57.
- (26) Montano, M.A., Kripke, K., Novina, C.D., Achacoso, P., Herzenberg, L.A., Roy, A.L., and Nolan, G.P. (1996) NF- $\kappa$ B homodimer binding within the HIV-1 initiator region and interactions with TFII-I. *PNAS*, 93: 12376-12381.
- (27) Kinsella, T.M. and Nolan, G.P. (1996) Episomal vectors rapidly and stably produce high-titer recombinant retrovirus. *Human Gene Therapy*. 7: 1405-1413.
- (28) Lorincz, M., Roederer, M., D. Zhenjun, Herzenberg, L.A. and Nolan, G.P. (1996) Enzyme-Generated Intracellular Fluorescence For Single-Cell Reporter Gene Analysis Utilizing *Escherichia coli*  $\beta$ -Glucuronidase. *Cytometry*, 24: 321-329.
- (29) Hofmann, A., Nolan, G.P. and Blau, H.M. (1996) Rapid retroviral delivery of tetracycline-inducible genes in a single autoregulatory cassette. *PNAS*, 93: 5185-5190.
- (30) Choate, K.A., Kinsella, T., Williams, M., Nolan, G.P. and Khavari, P.A. (1996) Transglutaminase 1 gene delivery in lamellar ichthyosis. *Human Gene Therapy*, 7:2247-2253.
- (31) Anderson, M.T., Tjioe, I.M., Lorincz, M.C., Parks, D.R., Herzenberg, L.A., Nolan, G.P., & Herzenberg, L.A. (1996) Simultaneous FACS analysis of two distinct transcriptional elements within a single cell using engineered green fluorescent proteins. *PNAS*. 93:8508-8511.
- (32) Onishi, M., Kinoshita, S., Morikawa, Y., Shibuya, A., Phillips, J., Lanier, L.L., Gorman, D.M., Nolan, G.P., Miyajima, A., Kitamura, T. (1996) Applications of retrovirus-mediated expression cloning. *Experimental Hematology*, 24:324-329.
- (33) Onishi, M., Mul, A.L.-F., Morikawa, Y., Cho, L., Kinoshita, S., Nolan, G.P., Gorman, D.M., Miyajima, A., Kitamura, T. (1996) Identification of an oncogenic form of the Thrombopoietin receptor MPL using retrovirus-mediated gene transfer. *Blood*, 88:1399-1406.
- (34) Shaw, M.K., Lorens, J.B., Dhawan, A., DalCanto, R., Tse, H.Y., Tran, A.B., Bonpane, C., Eswaran, S.L., Brocke, S., Sarvetnick, N., Steinman, L., Nolan, G.P., Fathman, C.G. (1997) Local Delivery of Interleukin 4 by Retrovirus-Transduced T Lymphocytes Ameliorates Experimental Autoimmune Encephalomyelitis. *J. Exp. Med.*, 185(9):1-5.

- (35) Kinoshita, S., Su, L., Amano, M., Timmerman, L.A., Kaneshima, H., Nolan, G.P. (1997) The T Cell Activation Factor NF-ATc Positively Regulates HIV-1 Replication and Gene Expression in T Cells. *Immunity*, 6:235-244.
- (36) Nolan, G.P. (1997) Harnessing Viral Devices as Pharmaceuticals: Fighting HIV-1's Fire with Fire. *Cell*, 90(5):821-824.
- (37) Kim, D.T., Mitchell, D.J., Brockstedt, D.G., Fong, L., Nolan, G., Fathman, C.G., Engleman, E.G., and Rothbard, J.B. (1997) Introduction of Soluble Proteins into both MHC Class I Pathway by Conjugation to HIV *tat* Peptide. *J. of Immunology*. 159:1666-1668.
- (38) Heemskerk, M.H.M., Blom, B., Nolan, G.P., Stegmann, A.P.A., Bakker, A.Q., Weijer, K., Res, P.C.M., Spits, H. (1997) Inhibition of T cell and promotion of natural killer cell development by the dominant negative helix loop helix factor Id3. *J. Exp. Med.* 186(9):1597-1602.
- (39) Grignani, F., Kinsella, T., Mencarelli, A., Valtieri, M., Riganelli, D., Grignani, F., Lanfranccone, L., Peschle, C., Nolan, G.P., Pellici, P.G. (1998) High-efficiency gene transfer and selection of human hematopoietic progenitor cells with a hybrid EVB/retroviral vector expressing the green fluorescence protein. *Cancer Research*. 58(1):14-19.
- (40) Nolan, G.P. (1998) Transcription and the broken heart. *Nature*. 392:129-130.
- (41) Hitoshi, Y., Lorens, J., Kinoshita, S., Fisher, J., LaBarge, M., Zing, H.Z., Francke, U. and Nolan, G.P. (1998) Toso, a regulator of Fas-induced apoptosis. *Immunity*. 8:461-471.
- (42) Rothenberg, M., Fisher, J., Zapol, D., Anderson, D., Hitoshi, Y., Achacoso, P., and Nolan, G.P. (1998) Intracellular combinatorial chemistry with peptides in selection of Caspase-like inhibitors. NATO ASI Series, Vol. H 105:171-183. *Gene Therapy*.
- (43) Nolan, G.P. and A.R. Shatzman. (1998) Expression vectors and delivery systems. *Current Opinion in Biotechnology*. 9(5):447-450.
- (44) Kinoshita, S., Chen, B.K., Kaneshima, H. and Nolan, G.P. (1998) Host control of HIV-1 parasitism in T cells by the Nuclear Factor of Activated T cells (NFATc). *Cell*. Vol 95: November 25.
- (45) Rozinov, M.N. and G.P. Nolan. (1998) Evolution of peptides that modulate the spectral qualities of bound, small molecule fluorophores. *Chemistry & Biology*. 5(12):713-728.
- (46) Dal Canto, R.A., Costa, G., Shaw, M.D., Seroogy, C., Nolan, G.P., and C.G. Fathman. (1998) Local Delivery of Cytokines by Retrovirally Transduced Antigen-Specific TCR+ Hybridoma Cells in Experimental Autoimmune Encephalomyelitis. *Eur. Cytokine Netw.*, 9(3):83-92.

#### Submitted

- (47) Caldwell, J. and Nolan, G.P. A phosphorylation control element linking I $\kappa$ B- $\alpha$  to E2 ubiquitin-carrier protein motifs. Submitted.
- (48) Jeremy Caldwell and Garry P. Nolan. Genetic dissection of the I $\kappa$ B- $\alpha$  inactivation cascade: identification of two overlapping recognition motifs. Submitted.
- (49) Park, S.T., Nolan, G.P. and Sun, X-H. Growth Inhibition and Apoptosis Due to Restoration of E2A Activity in T-All Cells. Submitted.
- (50) Yang, S., Delgado, R., Woffendin, C., Barker, C.S., Yang, Z-y., Xu, L., Nolan, G.P. and G.J. Nabel. Generation of Retroviral Vector for Clinical Studies Using Transient Transfection. Submitted.
- (51) Susan Swift, James Lorens, Philip Achacoso, and Garry P. Nolan. Rapid production of retroviruses for efficient gene delivery to mammalian cells using 293T cell-based systems. *Current Protocols in Immunology*. Submitted.

#### In Preparation

- (52) Achacoso, P., Jaeger, G., Riggs, R. and Nolan, G.P. Phoenix: Amphotropic and Ecotropic lines for generation of stable and transient retrovirus for gene transduction.
- (53) Rothenberg, M., Fisher, J., Zapol, D., Anderson, D., Hitoshi, Y., Achacoso, P., and Nolan, G.P. Intracellular combinatorial chemistry with peptides in selection of Caspase-like inhibitors.
- (54) Lorens, J., Hitoshi, Y., and Nolan, G.P. ICAM-2, cloned in an anti-apoptosis, retroviral cDNA library screen, defines a novel role for adhesion molecules in oncogenic progression.
- (55) Foo, S.-Y. and Nolan, G.P. The I $\kappa$ B-like proto-oncogene B1-3 blockades oncogenic signaling by inducing checkpoint non-progression at G1.

- (56) Kinsella, T. and Nolan, G.P. Defined uptake pathways for HIV-1 Tat peptide. December 1998 submission.
- (57) Foo, S.-Y., Hoffman, D., Baltimore, D., and Nolan, G.P. The I $\kappa$ B family member Bcl-3 enforces cell cycle blockade in a p50-dependent manner.
- (58) Curran, M. and Nolan, G.P. Second generation Feline Immunodeficiency viruses for delivery of genes to nondividing cells. August 1998 submission.
- (59) Peele, B., Anderson, D., and Nolan, G.P. Design of a self-dimerizing peptide interface for constrained display of library surfaces.
- (60) Costa, G., Shaw, M., Fathman, G., and Nolan, G.P. Delivery of retroviruses to murine T cells requires activation of subset specific markers. November 1998 submission.
- (61) Xu, X., Luo, Y., Lorens, J., Payan, D., and Nolan, G.P. *In vivo* creation of taxol-inhibiting peptides dissect apoptosis induction pathways in oncogenic progression. November 1998 submission.
- (62) Lorens, J., Swift, S., Luo, Y., Payan, D., and Nolan, G.P. Library selection of anti-PCNA peptide aptamers for blockade of cell cycle progression.
- (63) Vaziri, H., Squire, J.A., Bradley, G., Kuba, R.M., Nolan, G.P., Zhang, H., Gulyas, S., Hill, R.P. and S. Benchimol. Genomic Integrity and telomere dynamics in telomerase induced extended life span fibroblast (TIELF) cells.
- (64) Klug, C.A., Sutton, R., Anderson, M., Savage, P., Nolan, T.P., and I.L. Weissman. Assessment of Barriers that Limit Retroviral Transduction of FACS-Purified, Long-Term Self-Renewing Hematopoietic Stem Cells.
- (65) Wang, C.K., Kinsella, T.M., Nelson, C.F., Nolan, G.P., and W.K. Hoeffler. Phenotypic Reversion of Junctional Epidermolysis Bullosa Keratinocytes by the Introduction of a Therapeutic Laminin-5 Chain Gene: Assays and Animal Model.

#### Chapters in Books

- (B1) Cloning, sequencing and differential splicing of the Lyt-2 gene. Hiromatsu Nakauchi, Garry P. Nolan, Masatoshi Tagawa, Leonard A. Herzenberg. New Horizons in Animal Models for Autoimmune Disease. Academic Press. 1987. pp 133-140.
- (B2) In Situ detection of transcriptionally-active chromatin and genetic regulatory elements in individual viable mammalian cells. William G. Kerr, Garry P. Nolan, Leonard A. Herzenberg. (1989) Immunology. Special Conference edition, Vol. 68, supplement 2, pp 74-79.
- (B3) Lymphoid VDJ recombinase activity: Development of a novel fluorescence-based assay system. George D. Yancopoulos, Garry P. Nolan, Roberta Pollock, Suzanne Li, Leonard A. Herzenberg, and Frederick W. Alt. (1989) Vectors as Tools for the Study of Normal and Abnormal Growth and Differentiation. Edited by H. Lothar et al. Springer-Verlag, NATO Series, Vol H 34.
- (B4) Use of E. coli lacZ (b-galactosidase) as a reporter gene. Grant R. MacGregor, Garry P. Nolan, Steven Feiring, Mario Roederer and Leonard A. Herzenberg. Gene Transfer and Expression Protocols. Volume 7. Edited by E.J. Murray. The Humana Press. (1990). p 217-230.
- (B5) Transcriptionally-defective retroviruses containing lacZ for the in situ detection of endogenous genes and developmentally-regulated chromatin. William G. Kerr, Garry P. Nolan, Andrew Serafini, Leonard Herzenberg. (1990) Cold Spring Harbor Symposia in Quantitative Biology. Volume 54, pp 767-776.
- (B6) In situ detection of stage-specific genes and enhancers in B cell differentiation via gene-search retrovirus. William G. Kerr, Garry P. Nolan, Jeffrey Johnson, and Leonard A. Herzenberg. (1990) Adv. in Exp. Biol. Med. Vol 292 pp 217-230.
- (B7) Applications of retrovirus-mediated expression cloning. Mayumi Onishi, Shigemi Kinoshita, Yoshihiro Morikawa, Akira Shibuya, Joe Phillips, Lewis L. Lanier, Daniel M. Gorman, Garry P. Nolan, Atsushi Miyajima, Toshio Kitamura. (1996) Experimental Hematology. Volume 24 pp 324-329.
- (B8) Pear, W., Scott, M., and Nolan, G.P. (1997) Generation of high titre, helper-free retroviruses by transient transfection. In Methods in Molecular Medicine: Gene Therapy Protocols, (P. Robbins, ed.), Humana Press, Totowa, NJ), pp. 41-57.

#### Edited Books:

Nolan, G.P. and Schwartzman, T., Gene Therapy and Protein Expression Technologies. Current Opinion in Biotechnology. In press.

### Invited Reviews to be submitted Fall 1998:

Foo, S-Y. and Nolan, G.P. NF- $\kappa$ B to the Rescue -Rels, Apoptosis and Cellular Transformation Trends in Genetics. (submitted)

Nolan, G.P. Combinatorial biological inquiries of shape space and intracellular applications. Chemistry and Biology.

### Patents

1. Monitoring of cells and trans-activating transcription elements. Garry P. Nolan, Steven Fiering, and Leonard A. Herzenberg. United States Patent # 5,070,012. Dec. 3, 1991.
2. Rapid, stable high-titre production of recombinant retrovirus. Todd Kinsella and Garry P. Nolan. United States patent #5,830,725. Nov. 3, 1998.
3. Methods for screening for transdominant effector peptides and RNA molecules. Garry P. Nolan S. Michael Rothenberg. Patent pending.
4. Methods for screening for transdominant intracellular effector peptides and RNA molecules. Garry P. Nolan. Patent pending.
5. Toso, a cell-surface regulator of Fas-induced apoptosis. Garry P. Nolan and Yasumichi Hitoshi. Patent pending.
6. Peptide and RNA Affinity-based Fluorophores. Garry P. Nolan and Michael Rozinov. Patent pending.
7. Combinatorial Enzymatic Complexes. Garry P. Nolan and Donald Payan. Patent pending.
8. Compositions and Their Uses for Transfer of Down-Regulatory Genes into Cells Associated with Inflammatory Responses. Edgar Engleman, Garry Fathman, Garry P. Nolan, Jonathon Rothbard and Samuel Strober. Patent pending.
9. Novel Method to Deliver biopolymers into Cells. Edgar Engleman, Garry Fathman, Garry P. Nolan, Jonathon Rothbard, Paul Wender, Dennis Mitchell and Lee Wright. Patent pending.